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Surface X-ray Diffraction Studies of Chemically Functionalized Epitaxial Graphene

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To realize the potential of graphene in next-generation technologies, graphene must be incorporated with a variety of materials to form devices. Recently, the growth of self-assembled organic monolayers on epitaxial graphene has shown promise in functionalizing the bare graphene sheet for additional post-growth chemistry. In this work, we present crystal truncation rod (CTR) studies of perylene-3, 4, 9, 10-tetracarboxylic dianhydride (PTCDA) on graphene. A model-independent vertical electron density profile the SiC/graphene interface is retrieved from the CTR data by means of Fienup-based analysis, and initial modeling of the PTCDA/Graphene/SiC system is reported. These results should help to elucidate the effect of the interface structures on the electronic properties in device-like conditions.